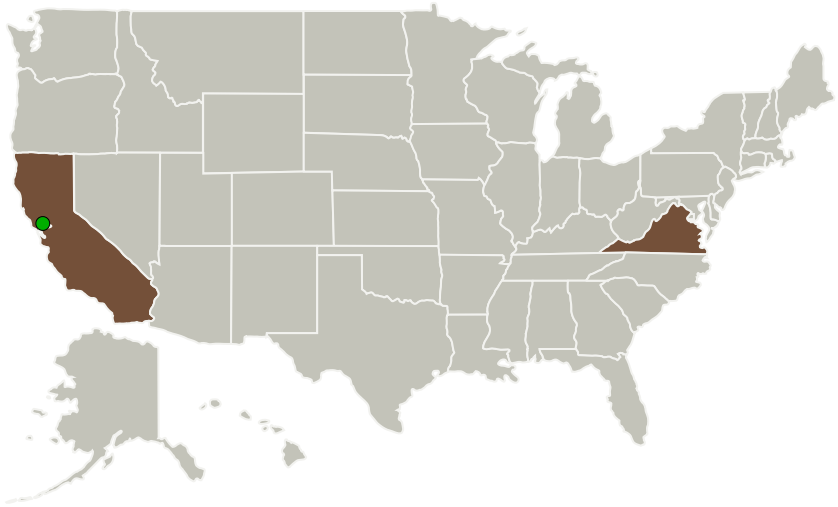
Research of Off-Nominal Airport Traffic Management using a Surface Management System-Based Simulation, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

The proposed project is complimentary and directly beneficial to NASA's Safe and Efficient Surface Operations (SESO) research. NASA has previously developed a modular architecture for testing airport control concepts and algorithms within the Surface Management System (SMS). However, SMS currently uses live or pre-recorded surveillance data and, therefore, must be connected to a separate simulation environment. We will develop a self-contained, fast-time SMS simulation environment by incorporating an aircraft taxi model. The proposed stand-alone platform would complement NASA's current SMS-ATG environment by providing a fast-time simulation capability that uses the desired SMS plug-in architecture. We will also develop and integrate within the SMS simulation departure scheduling and taxi planning algorithms. These algorithms will supplement NASA's existing work and be independent of external optimization solvers. Lastly, the project will apply the fast-time simulation and integrated planning algorithms to study JFK airport surface traffic management under regular and off-nominal conditions, studies that complement NASA's research. JFK was chosen because of its complex geometry and traffic. We have received permission from the FAA to use JFK data, which is already available to Mosaic ATM as part of our FAA work.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Mosaic ATM, Inc.	Lead Organization	Industry	Leesburg, Virginia
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Virginia

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Summary: Research of Off-Nominal Airport Traffic Management using a Surface Management System-Based Simulation, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139399)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Mosaic ATM, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

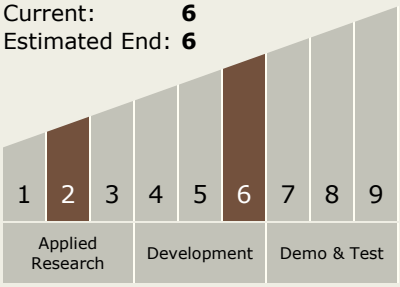
Carlos Torrez

Principal Investigator:

Stephen Atkins

Technology Maturity (TRL)

Start: **2**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.3 Traffic Management Concepts

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System